	Learning	g to Fly: The Wright B	rother's Adventure
	2006	Science and Technolo	ogy/Engineering
		Curriculum Frame	eworks
Massachusetts So	ience and Tec	hnology/Engineering	
Grades 9-12			
Activity/Lesson	State	Standards	
The Society	MA	SCI.9- 12.C.II.SIS4.4	Construct a reasoned argument and respond appropriately to critical comments and questions.
Wright Brothers:		SCI.9-	
1900 Glider	MA	12.E.II.SIS2.7	Follow safety guidelines.
Wright Brothers:		SCI.9-	Explain diagrams and charts that represent
1900 Glider	MA	12.E.II.SIS4.3	relationships of variables.
Wright Brothers: 1900 Glider	MA	SCI.9-12.E.III.4	Measure with accuracy and precision (e.g., length, volume, mass, temperature, time)
Wright Brothers: 1900 Glider	MA	SCI.9- 12.T.I.4.A.4.3	Explain how environmental conditions such as wind, solar angle, and temperature influence the design of buildings.
Wright Brothers: 1900 Glider	MA	SCI.9- 12.T.II.1.3.a	Students should be provided opportunities for hands-on experiences to design, build, test, and evaluate (and redesign, if necessary) a prototype or model of their solution to a problem. Students should have access to materials, hand and/or power tools, and other resources necessary to engage in these tasks. Students may also engage in design challenges that provide constraints and specifications to consider as they develop a solution to a problem: Brainstorm possible solutions Students should be provided opportunities
Wright Brothers: 1900 Glider Wright Brothers:	MA	SCI.9- 12.T.II.1.3.d SCI.9-	for hands-on experiences to design, build, test, and evaluate (and redesign, if necessary) a prototype or model of their solution to a problem. Students should have access to materials, hand and/or power tools, and other resources necessary to engage in these tasks. Students may also engage in design challenges that provide constraints and specifications to consider as they develop a solution to a problem.: efine the possible solutions Determine which solution(s) best meet(s) the
1900 Glider	ма	12.T.II.1.4.a	original requirements
.000 011001	1417 1	12.1.11.1.7.0	Measure with accuracy and precision
Wright Brothers:			(length, volume, mass, temperature, time,
1901 Glider	MA	SCI.9-12.P.III.4	` · · · · · · · · · · · · · · · · · ·
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		I	Understand that the engineering design
			Understand that the engineering design
			process is used in the solution of problems
			and the advancement of society. Identify and
			explain examples of technologies, objects,
Wright Brothers:		SCI.9-	and processes that have been modified to
1901 Glider	MA	12.T.I.1.A.1.2	advance society.
			Produce and analyze multi-view drawings
			(orthographic projections) and pictorial
Wright Brothers:		SCI.9-	(isometric, oblique, perspective) drawings
1901 Glider	MA	12.T.I.1.A.1.3	using various techniques.
			Interpret and apply scale and proportion to
Wright Brothers:		SCI.9-	orthographic projections and pictorial
1901 Glider	MA	12.T.I.1.A.1.4	drawings, such as, ½" = 1'0", 1 cm = 1 m.
			Interpret plans, diagrams, and working
Wright Brothers:		SCI.9-	drawings in the construction of prototypes or
1901 Glider	MA	12.T.I.1.A.1.5	models.
1901 Gildei	IVIA	12.1.1.1.7.1.3	
Wright Prothers		SCI.9-	Explain how environmental conditions such
Wright Brothers:	N 4 A		as wind, solar angle, and temperature
1901 Glider	MA	12.T.I.4.A.4.3	influence the design of buildings.
			Describe the advantages of using robotics in
.			the automation of manufacturing processes,
Wright Brothers:		SCI.9-	such as, increased production, improved
1901 Glider	MA	12.T.I.7.A.7.3	quality, and safety.
Wright Brothers:		SCI.9-	
1902 Glider	MA	12.E.II.SIS2.7	Follow safety guidelines.
Wright Brothers:		SCI.9-	Explain diagrams and charts that represent
1902 Glider	MA	12.E.II.SIS4.3	relationships of variables.
Wright Brothers:			Measure with accuracy and precision (e.g.,
1902 Glider	MA	SCI.9-12.E.III.4	length, volume, mass, temperature, time)
Wright Brothers:		SCI.9-	
1903 Flyer	MA	12.E.II.SIS2.7	Follow safety guidelines.
Wright Brothers:		SCI.9-	Explain diagrams and charts that represent
1903 Flyer	MA	12.E.II.SIS4.3	relationships of variables.
,			1
Wright Brothers:			Measure with accuracy and precision (e.g.,
1903 Flyer	MA	SCI 9-12 F III 4	length, volume, mass, temperature, time)
Wright Brothers:	1707 (SCI.9-	longin, voidino, mass, temperatare, time)
1903 Flyer	MA	12.B.II.SIS2.7	Follow safety guidelines.
Wright Brothers:	IVI/A	SCI.9-	Explain diagrams and charts that represent
1903 Flyer	MA	12.B.II.SIS4.3	relationships of variables.
1903 Flyel	IVIA		
4000. 1/345. 1 1-1-1-5	N 4 A	SCI.9-	Explain diagrams and charts that represent
1900: Kitty Hawks	MA	12.E.II.SIS4.3	relationships of variables.
			Marana de Marana de La Carta de
		001045	Measure with accuracy and precision (e.g.,
1900: Kitty Hawks	MA		length, volume, mass, temperature, time)
1901: The First		SCI.9-	Identify independent and dependent
Improvement	MA	12.E.II.SIS2.3	variables.
1901: The First		SCI.9-	Use and refine scientific models that
Improvement	MA	12.E.II.SIS4.6	simulate physical processes or phenomena.

1901: The First			Measure with accuracy and precision (e.g.,
Improvement	MA	SCI.9-12.E.III.4	length, volume, mass, temperature, time)
			Use appropriate metric/standard
			international (SI) units of measurement for
			mass (kg); length (m); time (s); force (N);
1901: The First		SCI.9-	speed (m/s); acceleration (m·s-2); and
Improvement	MA	12.E.III.9.2	frequency (Hz).
1901: The First		SCI.9-	Identify independent and dependent
Improvement	MA	12.B.II.SIS2.3	variables.
1901: The First		SCI.9-	Use and refine scientific models that
Improvement	МА	12.B.II.SIS4.6	simulate physical processes or phenomena.
mprovement	1777	12.5010 1.0	Measure with accuracy and precision
1901: The First			(length, volume, mass, temperature, time,
Improvement	MA	SCI.9-12.B.III.4	
1901: The First	1717 (SCI.9-	Identify independent and dependent
Improvement	MA	12.C.II.SIS2.3	variables.
improvement	IVIZ	12.0.11.0102.0	variables.
1901: The First		SCI.9-	Use and refine scientific models that
Improvement	MA	12.C.II.SIS4.6	simulate physical processes or phenomena.
Improvement	IVIZ	12.0.11.0104.0	Measure with accuracy and precision
1901: The First		SCI.9-	(length, volume, mass, temperature, time,
Improvement	MA	12.C.III.4	etc.)
·			Compare and contrast vector quantities (such as, displacement, velocity, acceleration, force, and linear momentum)
1901: The First		SCI.9-	and scalar quantities (such as, distance,
Improvement	MA	12.P.I.1.A.1.1	speed, energy, mass, and work).
1901: The First Improvement	MA	SCI.9- 12.P.I.1.A.1.5	Use a free-body force diagram to show forces acting on a system consisting of a pair of interacting objects. For a diagram with only co-linear forces, determine the net force acting on a system and between the objects.
			Distinguish qualitatively between static and
1901: The First		SCI.9-	kinetic friction, and describe their effects on
Improvement	MA	12.P.I.1.A.1.6	the motion of objects.
1901: The First		SCI.9-	Describe conceptually the forces involved in
Improvement	MA	12.P.I.1.A.1.8	circular motion.
1901: The First		SCI.9-	Identify independent and dependent
Improvement	MA	12.P.II.SIS2.3	variables.
1901: The First		SCI.9-	Use and refine scientific models that
Improvement	MA	12.P.II.SIS4.6	simulate physical processes or phenomena.
provomont	1017 1	12.1 .11.010-7.0	Measure with accuracy and precision
1901: The First			(length, volume, mass, temperature, time,
Improvement	MA	SCI.9-12.P.III.4	, -
Improvement	1417 (001.0 12.1 .111.4	0.0.,

			Identify and explain the steps of the
			engineering design process. The design
			process steps are identify the problem;
			research the problem; develop possible
			solutions; select the best possible
1001. The First		001.0	solution(s); construct prototypes and/or
1901: The First	N.4.0	SCI.9-	models; test and evaluate; communicate the
Improvement	MA	12.T.I.1.A.1.1	solutions; and redesign.
4004. The First		001.0	Interpret plans, diagrams, and working
1901: The First	N.4.0	SCI.9-	drawings in the construction of prototypes or
Improvement	MA	12.T.I.1.A.1.5	models.
			Distinguish among tension, compression,
		201.0	shear, and torsion, and explain how they
1901: The First		SCI.9-	relate to the selection of materials in
Improvement	MA	12.T.I.2.A.2.2	structures.
1901: The First		SCI.9-	Calculate the resultant force(s) for a
Improvement	MA	12.T.I.2.A.2.4	combination of live loads and dead loads.
			Calculate and describe the ability of a
1901: The First		SCI.9-	hydraulic system to multiply distance,
Improvement	MA	12.T.I.3.A.3.3	multiply force, and effect directional change.
			Explain how environmental conditions such
1901: The First		SCI.9-	as wind, solar angle, and temperature
Improvement	MA	12.T.I.4.A.4.3	influence the design of buildings.
1901: The First		SCI.9-	Model the selected solution(s) in two and
Improvement	MA	12.T.II.1.5.a	three dimensions
			Measure with accuracy and precision
1901: The First			(length, volume, mass, temperature, time,
Improvement	MA	SCI.9-12.T.III.4	etc.)
			Use appropriate metric/standard
			international (SI) units of measurement for
			mass (kg); length (m); time (s); power (W);
			electric current (A); electric potential
1901: The First		SCI.9-	difference/voltage (V); and electric
Improvement	MA	12.T.III.10.3	resistance (omega)
			Pose questions and form hypotheses based
		SCI.9-	on personal observations, scientific articles,
New Data	MA	12.E.II.SIS1.2	experiments, and knowledge.
			Explain how the transfer of energy through
			radiation, conduction, and convection
		SCI.9-	contributes to global atmospheric processes,
New Data	MA	12.E.I.1.A.1.3	such as storms, winds, and currents.
			Provide examples of how the unequal
			heating of Earth and the Coriolis effect
			influence global circulation patterns, and
			show how they impact Massachusetts
			weather and climate (e.g., global winds,
		SCI.9-	convection cells, land/sea breezes,
New Data	MA	12.E.I.1.A.1.4	mountain/valley breezes).
I TOW Data	IVI/-\	12.6.1.1.7.1.4	mountain valies bicezes).

			Describe the various conditions associated
			with frontal boundaries and cyclonic storms
			(e.g., thunderstorms, winter storms
		001.0	[nor'easters], hurricanes, tornadoes) and
		SCI.9-	their impact on human affairs, including
New Data	MA	12.E.I.1.A.1.6	storm preparations.
			Explain the dynamics of oceanic currents,
			including upwelling, deep-water currents, the
			Labrador Current and the Gulf Stream, and
		SCI.9-	their relationship to global circulation within
New Data	MA	12.E.I.1.A.1.7	the marine environment and climate.
			Read, interpret, and analyze a combination
			of ground-based observations, satellite data,
		SCI.9-	and computer models to demonstrate Earth
New Data	MA	12.E.I.1.A.1.8	systems and their interconnections.
		SCI.9-	Select required materials, equipment, and
New Data	MA	12.E.II.SIS2.2	conditions for conducting an experiment.
			Use results of an experiment to develop a
			conclusion to an investigation that addresses
		SCI.9-	the initial questions and supports or refutes
New Data	MA	12.E.II.SIS3.3	the stated hypothesis.
		SCI.9-	State questions raised by an experiment that
New Data	MA	12.E.II.SIS3.4	may require further investigation.
			Review information, explain statistical
		SCI.9-	analysis, and summarize data collected and
New Data	MA	12.E.II.SIS4.2	analyzed as the result of an investigation.
			Measure with accuracy and precision (e.g.,
New Data	MA	SCI.9-12.E.III.4	length, volume, mass, temperature, time)
			Pose questions and form hypotheses based
_		SCI.9-	on personal observations, scientific articles,
New Data	MA	12.B.II.SIS1.2	experiments, and knowledge.
_		SCI.9-	Select required materials, equipment, and
New Data	MA	12.B.II.SIS2.2	conditions for conducting an experiment.
			Use results of an experiment to develop a
			conclusion to an investigation that addresses
		SCI.9-	the initial questions and supports or refutes
New Data	MA	12.B.II.SIS3.4	the stated hypothesis.
		SCI.9-	State questions raised by an experiment that
New Data	MA	12.B.II.SIS3.5	may require further investigation.
			Review information, explain statistical
		SCI.9-	analysis, and summarize data collected and
New Data	MA	12.B.II.SIS4.2	analyzed from an investigation.
			Measure with accuracy and precision
			(length, volume, mass, temperature, time,
New Data	MA	SCI.9-12.B.III.4	,
			Pose questions and form hypotheses based
		SCI.9-	on personal observations, scientific articles,
New Data	MA	12.C.II.SIS1.2	experiments, and knowledge.
		SCI.9-	Select required materials, equipment, and
New Data	MA	12.C.II.SIS2.2	conditions for conducting an experiment.

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1902: Success at		SCI.9-	Use and refine scientific models that
Last	MA	12.C.II.SIS4.6	simulate physical processes or phenomena.
			Measure with accuracy and precision
1902: Success at		SCI.9-	(length, volume, mass, temperature, time,
Last	MA	12.C.III.4	etc.)
1902: Success at		SCI.9-	Determine percent error from experimental
Last	MA	12.C.III.9.2	and accepted values.
			·
1902: Success at		SCI.9-	Use and refine scientific models that
Last	MA	12.P.II.SIS4.6	simulate physical processes or phenomena.
			Measure with accuracy and precision
1902: Success at			(length, volume, mass, temperature, time,
Last	MA	SCI.9-12.P.III.4	etc.)
1902: Success at		SCI.9-	Determine percent error from experimental
Last	MA	12.P.III.8.2	and accepted values.
			·
			Use appropriate metric/standard
			international (SI) units of measurement for
			mass (kg); length (m); time (s); force (N);
			speed (m/s); acceleration (m·s-2); frequency
			(Hz); work and energy (J); power (W);
			momentum (kg•m/s); electric current (A);
1902: Success at		SCI.9-	electric potential difference/voltage (V); and
Last	MA	12.P.III.8.3	electric resistance (omega).
			Identify and explain the steps of the
			engineering design process. The design
			process steps are identify the problem;
			research the problem; develop possible
			solutions; select the best possible
			solution(s); construct prototypes and/or
1902: Success at		SCI.9-	models; test and evaluate; communicate the
Last	MA	12.T.I.1.A.1.1	solutions; and redesign.
			Understand that the engineering design
			process is used in the solution of problems
			and the advancement of society. Identify and
			explain examples of technologies, objects,
1902: Success at		SCI.9-	and processes that have been modified to
Last	MA	12.T.I.1.A.1.2	advance society.
			Produce and analyze multi-view drawings
			(orthographic projections) and pictorial
1902: Success at		SCI.9-	(isometric, oblique, perspective) drawings
Last	MA	12.T.I.1.A.1.3	using various techniques.
			Interpret and apply scale and proportion to
1902: Success at		SCI.9-	orthographic projections and pictorial
Last	MA	12.T.I.1.A.1.4	drawings, such as, 1/4" = 1'0", 1 cm = 1 m.
			Interpret plans, diagrams, and working
1902: Success at		SCI.9-	drawings in the construction of prototypes or
Last	MA	12.T.I.1.A.1.5	models.
			Recognize the purpose of zoning laws and
1902: Success at		SCI.9-	building codes in the design and use of
Last	MA	12.T.I.2.A.2.6	structures.

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			Calculate and describe the ability of a
1902: Success at		SCI.9-	hydraulic system to multiply distance,
Last	MA	12.T.I.3.A.3.3	multiply force, and effect directional change.
			Give examples of how conduction,
			convection, and radiation are considered in
1902: Success at		SCI.9-	the selection of materials for buildings and in
Last	MA	12.T.I.4.A.4.2	the design of a heating system.
			Explain how environmental conditions such
1902: Success at		SCI.9-	as wind, solar angle, and temperature
Last	MA	12.T.I.4.A.4.3	influence the design of buildings.
1902: Success at		SCI.9-	
Last	MA	12.T.II.1.1.1	Identify the need or problem
1902: Success at		SCI.9-	Examine current state of the issue and
Last	MA	12.T.II.1.2.a	current solutions
1902: Success at		SCI.9-	Explore other options via the Internet, library,
Last	MA	12.T.II.1.2.b	interviews, etc.
			Students should be provided opportunities
			for hands-on experiences to design, build,
			test, and evaluate (and redesign, if
			necessary) a prototype or model of their
			solution to a problem. Students should have
			access to materials, hand and/or power
			tools, and other resources necessary to
			engage in these tasks. Students may also
			engage in design challenges that provide
			constraints and specifications to consider as
1902: Success at		SCI.9-	they develop a solution to a problem:
Last	MA	12.T.II.1.3.a	Brainstorm possible solutions
			Students should be provided opportunities
			for hands-on experiences to design, build,
			test, and evaluate (and redesign, if
			necessary) a prototype or model of their
			solution to a problem. Students should have
			access to materials, hand and/or power
			tools, and other resources necessary to
			engage in these tasks. Students may also
			engage in design challenges that provide
1,000 0		201.0	constraints and specifications to consider as
1902: Success at		SCI.9-	they develop a solution to a problem: Draw
Last	MA	12.T.II.1.3.b	on mathematics and science

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		SCI.9-	
1903: Powered		12.B.II.SIS3.1.	Represent data and relationships between
Flight	МА		variables in charts and graphs.
i ligiti	IVIA	a SCI.9-	variables in charts and graphs.
1903: Powered			lles engrenziete technology (evek ee
	N 4 A	12.B.II.SIS3.1.	Use appropriate technology (such as
Flight	MA	b	graphing software, etc.) and other tools.
4000: Davis and		001.0	
1903: Powered		SCI.9-	Use and refine scientific models that
Flight	MA	12.B.II.SIS4.6	simulate physical processes or phenomena.
1903: Powered			Construct and use tables and graphs to
Flight	MA	SCI.9-12.B.III.1	interpret data sets.
			Measure with accuracy and precision
1903: Powered			(length, volume, mass, temperature, time,
Flight	MA	SCI.9-12.B.III.4	
1903: Powered		SCI.9-	Select required materials, equipment, and
Flight	MA	12.C.II.SIS2.2	conditions for conducting an experiment.
		SCI.9-	
1903: Powered		12.C.II.SIS3.A.	Represent data and relationships between
Flight	MA	a	variables in charts and graphs.
		SCI.9-	9 .
1903: Powered		12.C.II.SIS3.A.	Use appropriate technology (such as
Flight	MA	b	graphing software, etc.) and other tools.
g			graprining controller, every and concerted in
1903: Powered		SCI.9-	Use and refine scientific models that
Flight	MA	12.C.II.SIS4.6	simulate physical processes or phenomena.
1903: Powered	1777	SCI.9-	Construct and use tables and graphs to
Flight	MA	12.C.III.1	interpret data sets.
i ligiti	1417 (12.0.111.1	Measure with accuracy and precision
1903: Powered		SCI.9-	(length, volume, mass, temperature, time,
Flight	МА	12.C.III.4	etc.)
i ligiti	IVIA	12.0.111.4	Compare and contrast vector quantities
			1
			(such as, displacement, velocity,
4000: Davis and		001.0	acceleration, force, and linear momentum)
1903: Powered		SCI.9-	and scalar quantities (such as, distance,
Flight	MA	12.P.I.1.A.1.1	speed, energy, mass, and work).
			Distinguish between displacement, distance,
 			velocity, speed, and acceleration. Solve
1903: Powered		SCI.9-	problems involving displacement, distance,
Flight	MA	12.P.I.1.A.1.2	velocity, speed, and constant acceleration.
			Create and interpret graphs of 1-dimensional
			motion, such as position vs. time, distance
			vs. time, speed vs. time, velocity vs. time,
1903: Powered		SCI.9-	and acceleration vs. time where acceleration
Flight	MA	12.P.I.1.A.1.3	is constant.
1903: Powered		SCI.9-	Select required materials, equipment, and
Flight	MA	12.P.II.SIS2.2	conditions for conducting an experiment.
		SCI.9-	
1903: Powered		12.P.II.SIS3.A.	Represent data and relationships between
Flight	MA	a	variables in charts and graphs.
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		SCI.9-	
1903: Powered		12.P.II.SIS3.A.	Use appropriate technology (such as
Flight	МА	b	graphing software, etc.) and other tools.
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1903: Powered		SCI.9-	Use and refine scientific models that
Flight	МА	12.P.II.SIS4.6	simulate physical processes or phenomena.
1903: Powered	17.7	12.11 1111010 110	Construct and use tables and graphs to
Flight	МА	SCI.9-12.P.III.1	
i iigiit	1417 (001.0 12.1 .111.1	Measure with accuracy and precision
1903: Powered			(length, volume, mass, temperature, time,
Flight	MA	SCI.9-12.P.III.4	, -
i iigiit	1717 (001.0 12.1 .111.7	oto.j
			Use appropriate metric/standard
			international (SI) units of measurement for
			mass (kg); length (m); time (s); force (N);
			speed (m/s); acceleration (m•s-2); frequency
			(Hz); work and energy (J); power (W);
			• • • • • • • • • • • • • • • • • • • •
4000: Davis and		001.0	momentum (kg•m/s); electric current (A);
1903: Powered	B 4 A	SCI.9-	electric potential difference/voltage (V); and
Flight	MA	12.P.III.8.3	electric resistance (omega).
			Identify and explain the steps of the
			engineering design process. The design
			process steps are identify the problem;
			research the problem; develop possible
			solutions; select the best possible
			solution(s); construct prototypes and/or
1903: Powered		SCI.9-	models; test and evaluate; communicate the
Flight	MA	12.T.I.1.A.1.1	solutions; and redesign.
			Understand that the engineering design
			process is used in the solution of problems
			and the advancement of society. Identify and
			explain examples of technologies, objects,
1903: Powered		SCI.9-	and processes that have been modified to
Flight	MA	12.T.I.1.A.1.2	advance society.
			Produce and analyze multi-view drawings
			(orthographic projections) and pictorial
1903: Powered		SCI.9-	(isometric, oblique, perspective) drawings
Flight	MA	12.T.I.1.A.1.3	using various techniques.
			Interpret and apply scale and proportion to
1903: Powered		SCI.9-	orthographic projections and pictorial
Flight	MA	12.T.I.1.A.1.4	drawings, such as, 1/4" = 1'0", 1 cm = 1 m.
_			Interpret plans, diagrams, and working
1903: Powered		SCI.9-	drawings in the construction of prototypes or
Flight	MA	12.T.I.1.A.1.5	models.
			Recognize the purpose of zoning laws and
1903: Powered		SCI.9-	building codes in the design and use of
Flight	MA	12.T.I.2.A.2.6	structures.
3 -			
			Calculate and describe the ability of a
1903: Powered		SCI.9-	hydraulic system to multiply distance,
Flight	MA	12.T.I.3.A.3.3	multiply force, and effect directional change.
Li ligiti	141/ 1	12.1.1.0.7.0.0	maniply force, and offeet difectional originge.

			Give examples of how conduction,
			convection, and radiation are considered in
1903: Powered		SCI.9-	the selection of materials for buildings and in
Flight	MA	12.T.I.4.A.4.2	the design of a heating system.
		1-1111111111	Explain how environmental conditions such
1903: Powered		SCI.9-	as wind, solar angle, and temperature
Flight	МА	12.T.I.4.A.4.3	influence the design of buildings.
ı ııgı.ı.	1477	12.11.11.11.11	Students should be provided opportunities
			for hands-on experiences to design, build,
			test, and evaluate (and redesign, if
			necessary) a prototype or model of their
			solution to a problem. Students should have
			access to materials, hand and/or power
			tools, and other resources necessary to
			engage in these tasks. Students may also
			engage in design challenges that provide
			constraints and specifications to consider as
1903: Powered		SCI.9-	·
Flight	MA	12.T.II.1.1.1	they develop a solution to a problem: Identify the need or problem
Filgrit	IVIA	12.1.11.1.1.1	Students should be provided opportunities
			for hands-on experiences to design, build,
			test, and evaluate (and redesign, if
			` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` ` `
			necessary) a prototype or model of their
			solution to a problem. Students should have access to materials, hand and/or power
			tools, and other resources necessary to
			engage in these tasks. Students may also
			• •
			engage in design challenges that provide
			constraints and specifications to consider as
4000: Davisara d		001.0	they develop a solution to a problem:
1903: Powered	N.4.0	SCI.9-	Examine current state of the issue and
Flight	MA	12.T.II.1.2.a	current solutions
1903: Powered	N40	SCI.9-	Explore other options via the Internet, library,
Flight	MA	12.T.II.1.2.b	interviews, etc.
			Students should be provided opportunities
			for hands-on experiences to design, build,
			test, and evaluate (and redesign, if
1			necessary) a prototype or model of their
			solution to a problem. Students should have
			access to materials, hand and/or power
			tools, and other resources necessary to
			engage in these tasks. Students may also
			engage in design challenges that provide
l <u>.</u> .			constraints and specifications to consider as
1903: Powered		SCI.9-	they develop a solution to a problem:
Flight	MA	12.T.II.1.3.a	Brainstorm possible solutions

			Students should be provided opportunities
			for hands-on experiences to design, build,
			test, and evaluate (and redesign, if
			necessary) a prototype or model of their
			solution to a problem. Students should have
			access to materials, hand and/or power
			tools, and other resources necessary to
			engage in these tasks. Students may also
			engage in design challenges that provide
			constraints and specifications to consider as
1903: Powered		SCI.9-	they develop a solution to a problem: Draw
	MA	12.T.II.1.3.b	on mathematics and science
Flight	IVIA	12.1.11.1.3.0	
			Students should be provided opportunities
			for hands-on experiences to design, build,
			test, and evaluate (and redesign, if
			necessary) a prototype or model of their
			solution to a problem. Students should have
			access to materials, hand and/or power
			tools, and other resources necessary to
			engage in these tasks. Students may also
			engage in design challenges that provide
			constraints and specifications to consider as
			they develop a solution to a problem:
1903: Powered		SCI.9-	Articulate the possible solutions in two and
Flight	MA	12.T.II.1.3.c	three dimensions
			Students should be provided opportunities
			for hands-on experiences to design, build,
			test, and evaluate (and redesign, if
			necessary) a prototype or model of their
			solution to a problem. Students should have
			access to materials, hand and/or power
			tools, and other resources necessary to
			engage in these tasks. Students may also
			engage in design challenges that provide
			constraints and specifications to consider as
1903: Powered		SCI.9-	they develop a solution to a problem: Refine
Flight	MA	12.T.II.1.3.d	the possible solutions
1903: Powered		SCI.9-	Determine which solution(s) best meet(s) the
Flight	MA	12.T.II.1.4.a	original requirements
1903: Powered		SCI.9-	Model the selected solution(s) in two and
Flight	MA	12.T.II.1.5.a	three dimensions

1903: Powered Flight	MA	SCI.9- 12.T.II.1.6.a	Students should be provided opportunities for hands-on experiences to design, build, test, and evaluate (and redesign, if necessary) a prototype or model of their solution to a problem. Students should have access to materials, hand and/or power tools, and other resources necessary to engage in these tasks. Students may also engage in design challenges that provide constraints and specifications to consider as they develop a solution to a problem: Does it work?
1903: Powered		SCI.9-	Students should be provided opportunities for hands-on experiences to design, build, test, and evaluate (and redesign, if necessary) a prototype or model of their solution to a problem. Students should have access to materials, hand and/or power tools, and other resources necessary to engage in these tasks. Students may also engage in design challenges that provide constraints and specifications to consider as they develop a solution to a problem: Does it
Flight	MA	12.T.II.1.6.b	meet the original design constraints?
1903: Powered		00104071114	Construct and use tables and graphs to
Flight	MA	SCI.9-12.1.III.1	interpret data sets.
1903: Powered Flight	MA	SCI.9-12.T.III.4	,
1903: Powered Flight	MA	SCI.9- 12.T.III.10.3	Use appropriate metric/standard international (SI) units of measurement for mass (kg); length (m); time (s); power (W); electric current (A); electric potential difference/voltage (V); and electric resistance (omega)
1904: Improvement in Dayton	MA	SCI.9- 12.E.II.SIS2.1	Articulate and explain the major concepts being investigated and the purpose of an investigation.
1904: Improvement in Dayton	MA	SCI.9- 12.E.II.SIS2.4	Write procedures that are clear and replicable.
1904: Improvement in Dayton	MA	SCI.9- 12.E.II.SIS4.3	Explain diagrams and charts that represent relationships of variables.
1904: Improvement in Dayton	MA	SCI.9- 12.E.II.SIS4.5	Use language and vocabulary appropriately, speak clearly and logically, and use appropriate technology (e.g., presentation software) and other tools to present findings.
1904: Improvement in Dayton	MA	SCI.9-12.E.III.4	Measure with accuracy and precision (e.g., length, volume, mass, temperature, time)

			Measure with accuracy and precision
1905: Complete a			(length, volume, mass, temperature, time,
Flight at Last	MA	SCI.9-12.P.III.4	etc.)
1905: Complete a		SCI.9-	Examine current state of the issue and
Flight at Last	MA	12.T.II.1.2.a	current solutions
1905: Complete a		SCI.9-	Explore other options via the Internet, library,
Flight at Last	MA	12.T.II.1.2.b	interviews, etc.
			Measure with accuracy and precision
1905: Complete a			(length, volume, mass, temperature, time,
Flight at Last	MA	SCI.9-12.T.III.4	etc.)